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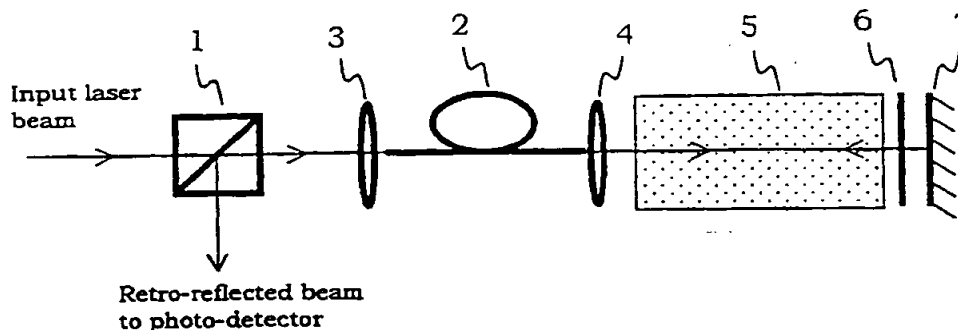
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(54) Title: **APPARATUS AND METHOD FOR GAS SENSING**



(57) Abstract: An apparatus for remote gas sensing comprises a light source, a polarising beam splitter (1), a photodetector, a single polarisation preserving optical fibre (2), a gas cell (5) or a zone through which the gas passes, a quarter-wave plate (6) and a mirror (7). A light beam from the light source passes through the beam splitter (1) and is focused by a lens (3) into the fibre (2) where it travels maintaining its polarisation state. Upon exiting the fibre (2), the light is collimated by a second lens (4) and propagates through the gas cell (5) and the quarter-wave plate (6) in a double pass configuration being retro-reflected by the mirror (7). The light beams is then focused back into the fibre (2) where it propagates with a polarisation state which is perpendicular to that of the forward propagating light. When light emerges from the fibre (2), it is reflected by the beam splitter (1) onto the photodetector.

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